



ANAESTHESIA FOR REMOTE LOCATIONS

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ABSTRACT Non-operating room anaesthesia (NORA) describes anaesthesia provided outside a traditional operating room (OR). Due to technological advancements, increasing requirement is there for providing anaesthesia beyond operating room, outside of safe zones for anesthetist. It comes with lot of challenges like lack of team familiarity, limited preoperative evaluation, new locations, inadequate monitoring devices and restricted access to patients. Anaesthesia at remote locations require extreme vigilance, more expertise, knowledge about procedures.

KEYWORDS : NORA, Anaesthesia for Remote Locations.

INTRODUCTION:

Nonoperating room anesthesia (NORA) refers to administration of sedation/anesthesia outside the operating room to patients undergoing various procedures like gastroenterology imaging, neurosurgery, dental, radiology, pediatric cardiac catheterization, psychiatric treatment (ECT), interventional radiology etc. These procedures are increasing due to medical advancements and anaesthesia providers are frequently asked to administer anaesthesia outside of their safe zone. It comes with lot of challenges like lack of team familiarity, limited preoperative evaluation, new locations, inadequate monitoring devices and restricted access to patients to name a few. Opportunity for adverse events increases as these procedures are increasing day by day in number and done outside the safe zone. Therefore, standards according to specific procedures should be implemented and anesthesia provider must be extreme vigilant, to avoid the adverse events.

CONSIDERATIONS:

Patient Considerations:

- Whether the patient will tolerate sedation or require general anaesthesia
- ASA classification
- Comorbidities
- Monitoring

Procedure Considerations:

- Understand the nature of the procedure
- Position of the patient
- Duration
- Discuss with the proceduralist about contingencies for emergencies and adverse outcomes

Environmental Considerations:

- Establish the presence and functioning of all equipments
- Location of resuscitation equipments

Procedures:

- Radiological Imaging: CT/MRI/PET
- Interventional Neuroradiology
- Occlusive procedures: Embolization
- Opening procedures: Acute stroke
- Cardiac Catheterization:
 - Percutaneous coronary intervention
 - Ventricular assist devices
- Gastroenterology: Endoscopy/ Colonoscopy
- Psychiatry: ECT

The American Society of Anesthesiology (ASA) has provided minimal guidelines for anesthesia in the nonoperating room to improve the quality of patient care as follows¹

Guidelines For Non-operating Room Anesthesia

Each location should have

- Reliable source of oxygen adequate for the length of the

procedure, with a backup supply

- Adequate and reliable source of suction
- Adequate and reliable system for scavenging waste anesthetic gases
- Self-inflating hand resuscitator bag capable of administering > 90% oxygen
- Adequate anesthesia drugs, supplies, and equipment for the intended anesthesia care
- Adequate monitoring equipment to allow adherence to the "Standards for Basic Anesthetic Monitoring"
- Sufficient electrical outlets to satisfy anesthesia machine and monitoring equipment requirements

Provision for adequate illumination

- The patient, anesthesia machine, and monitoring equipment
- Battery-powered illumination other than a laryngoscope immediately available

Sufficient space

- Accommodate necessary equipment and personnel
- Allow expeditious access to the patient, anesthesia machine, and monitoring equipment

Immediate availability of an emergency cart

- Defibrillator, emergency drugs, and other equipment to provide cardiopulmonary resuscitation

Staff

- Trained anesthesiologist
- Adequate staff trained to support the anesthesiologist

Appropriate post-anesthetic management

- Adequate number of trained staff
- Appropriate equipment available to safely transport the patient to a post-anesthesia care unit

Complications:

1. Respiratory complications

Respiratory complications are dangerous but can be reduced by vigilance and following ASA guidelines. Caplan et al.² emphasized the need for a thorough evaluation of the airway, based on claims for difficult tracheal intubation preventable with better monitoring. It is evident that respiratory depression is more frequent during sedation or anesthesia outside the OR, so anesthesiologists must be familiar with the difficult airway algorithm.³ The most common event in NORA claims were inadequate oxygenation/ventilation,⁴ which are preventable with better monitoring, such as pulse oximetry and capnography. Preoxygenation should be preferred.

2. Postoperative nausea and vomiting (PONV)

Appropriate premedication should be given to reduce PONV. Sarin et al⁵ improved preexisting scores for predicting PONV in ambulatory surgery patients can be used for same.

3. Aspiration

Under sedatives protective airway reflexes are blunted and risk for aspiration increases. Preoperative fasting is as important as in patients preparing for elective surgery. However, prolonged fasting can cause dehydration and hypocalcemia in children.⁶

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